

A STUDY ON
MUZHANKAAL VAATHAM

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INTRODUCTION

The tremendous advancements made in the field of basic sciences namely physics, physical chemistry, chemistry, organic chemistry, electromagnetism and other varied fields of specialties have strengthened the basis of modern medicine. Modern medicine heavily depends upon the gross, material (molecular) aspect of the vital processes, which are involved in maintaining the pulsating life.

In contrast to this, the great Siddhars who have established the siddha medicine have emphasized the greater importance of recognizing the subtle and causal aspects of all vital processes. This they did, because they wanted to have a complete and précised understanding of the gross, subtle and causal forces and powers that are at play in the living organism.

Without such a total grasp of vital process, it is not possible to understand a state of affairs that are found in health and disease. If subtle and causal aspects are excluded, our knowledge will be partial, and approach will be piecemeal. That is why Siddhars solidly recognized three bodies, namely **gross body, subtle body** and **causal body**. Interestingly, they also explained **five**

koshas (Annamaya kosham, Manomaya koham, Pranamaya kosham, Vignngnaanamaya kosham and Anandamaya kosham). This establishes the fact that human body is not merely a machine. But human being is composed of different dimensions namely physical, mental, supra-mental and spiritual which all should work in harmony. So that perfect health is maintained. In short, the Siddhar's thoroughness and extraordinary knowledge that proceeded from the metaphysics of ancient India which is eternal.

Siddha means "Wisdom". Siddhars knew Cosmo-genesis (**Pirabhanja urpathi**) and explained them and also proclaimed that the macrocosm and microcosm are one at the real basic level.

“அண்டத்திலுள்ளதே பிண்டம்

பிண்டத்திலுள்ளதே அண்டம்

அண்டமும் பிண்டமும் ஒன்றே

அறிந்துதான் பார்க்கும் போதே”

This led to the understanding of the position of man in this universe and his relationship with it.

This goal of Siddhars was to achieve a perfect state of health by converting the mortal body into an immortal one (**Kaaya siddhi**) and also to merge with Godhood which they called the “**MUKTHI**” i.e. real release from the cycle of birth and death. They were able to convert their body into light or

space as they deemed fit. They lived in the immortal body till their purpose is fulfilled for the shake of fellow human being. Then they vanished from the world and merged in the glory of god.

All the things in the universe and also man are made up of **pancha-boothas** in their gross state as well as in the subtle state. In the siddha system of medicine, all vital processes (physiological, biochemical-metabolic) have been classified under three functional heads namely **VALI, AZHAL, IYYAM** (vaatham, pitham, kabam) these are called three **Uyir-thaathukal**. It is interesting to note that one and the same basic uyir-thaathu differentiates itself into three functional divisions-Vali, Azhal, Iyyam (**VAI**). The meaning of Uyir-thaathu is the route cause and basis of life.

The Siddhars even gave a mathematical formula that **VAI** exist in a ratio namely **1:1/2:1/4**. If this equilibrium is maintained, then perfect health is maintained. If this equilibrium is altered by vitiation or excitation of one or more of the above mentioned three, then disease results.

“Doctors of medicine deem that, as indicated by pulse,

Flex, bile and phlegm, in excess or short, cause disease”

---Thirukkural.941

Thus the cause of good health and cause for disease have been well defined. Only thing is that they considered all the vital processes in the three functional patterns, i.e. VAI.

The VAI in healthy state are called as Uyir-thaathus, and in the vitiated state are called three-dhoshams (thirithosham). This three have the pancha boothaic components given below.

ARUSUVAI:

Sweet	- Earth element + Water element
Sour	- Earth element + Fire element
Salty	- Water element + Fire element
Bitter	- Space element + wind element
Pungent	- Wind element + fire element
Astringent	- Earth element + Wind element

The significant of taste is that it not only gives a clue to the pancha bootha makeup but also the VEERIUM of a particular substance, all of which decide the medicinal properties of the substance. They are the potential properties which either aid or vitiate the three VAI. It should be mentioned that the body constitution (**Yaakkai**) is also defined and described on the basis of Vali, Azhal, Iyyam as three major body types and “Dwandha”-combination recombination of body constituents. These three thaathus VAI function in the seven Udal thaathukal and also in the subtle dimensions of mind, buddhi, siddham, ahankaaram (**Antha karanam-4**).

The Pulse reading (**Naadi**) forms the main diagnostic mode of Siddha medicine. Again this Naadi characteristic is also based on Vali, Azhal, Iyyam. All the diseases are brought under the three major divisions of Vali, Azhal, Iyyam as well as combination and recombination types.

The Siddha system is unique in that it recognizes disease conditions individually as well as in strict reference to the three-doshas principle. All diagnostic modes are designed to take into serious consideration the symptoms, signs, characteristics of the diseased conditions and rationally evaluate them in strict accordance with the three-dhosha principle.

The Siddha medicine also reveals its thoroughness of understanding the pathological states by advocating the eight fold evaluation (**En vagai thaervugal**). This important procedure forms the diagnostic methodology in investigating the disease, by examining the following eight categories i.e. Tongu (Naa), Complexion (Niram), Speech & Voice (Mozhi), Eye (Vizhi), Pulse reading (Naadi), Touch sensation (Sparisam), Faeces (Malam) and Urine (Moothiram). This was systematized from earliest times as evidenced by the Siddhars like Thaeraiyar and others. Similar diagnostic method is also found in Ayurvedha in the name “Asta sthaana pareeksha”. It should be mentioned that advanced research finding in all fields of sciences only strengthen the basic siddha concepts.

The Siddha system is first to recognize health as a perfect state of physical, psychological, spiritual and social components of human being.

“One that cures physical ailment is medicine

One that cures psychological ailment is medicine

One that prevents ailment is medicine

One that bestows immortality is medicine”

-Thirumoolar.

Siddha medicine is a perfect science and also has incorporated arts, science, philosophy, ethics and yoga. In olden days, a siddha physician was a highly evolved spiritual being and had an in-depth knowledge about three biological humors, eight-fold diagnostic methods, geographical and seasonal variations.

The great principles of siddha have to be explained in terms of modern science in order to gain the recognition and also to rediscover the truths. So in the present dissertation, an integrated attempt is made by considering both siddha aspects and corresponding modern medical aspects.

In the present dissertation, “**MUZHANKAAL VAATHAM**” which is one of the commonest degenerative diseases of loco-motor system is taken up for study. The pathological aspects of MUZHANKAAL VAATHAM are analyzed on the basis of siddha concepts namely, cause of disease, diagnostic methods and factors influencing this condition.

SIDDHA PHYSIOLOGY

Basically the anatomical, physiological and pathological view of the human body in siddha system abruptly differs from modern conventional medicine.

Anatomical view \Rightarrow body – mind – soul

Physiological view \Rightarrow Tri – humors theory

- Vali
- Azhal
- Iyyam

Pathological view \Rightarrow Thri-dosha theory

- Disequilibrium of Vali
- Disequilibrium of Azhal
- Disequilibrium of Iyyam.

The ancient Siddhars clearly depicted, the human body have the reciprocal relations of

PARABRAMA \Rightarrow PANCHAPOOTHAS \Rightarrow 96 BASIC FACTORS

(பரப்பிரமம்)

(பஞ்சபூதம்)

(அடிப்படைத்துவங்கள்)

UDALTHATHUS \Rightarrow AATHARAS

\Rightarrow ARUSUVAIHAL

(உடற்தாதுகள்)

(ஆதாரங்கள்)

(அறுசுவைகள்)



UYIRTHATHUS

(உயிர்த்தாதுகள்)

“உருப்பொருள் தாங்குமுடலு முயிரும்

உடற்காதார மொன் பஞ்சபூதம்

பஞ்சீகரணப் பாண்மையா மெனவும்

உயிர்க்காதார முயிர்த்தா தெனவும்

முப்பிரிவாகி முக்குணமு மாகி

உடலையு முயிரையு மோம்பிக்காத்து

வருமென முதுமறை வகுக்குந்துனிபே”

In terms of etiology, the above indicates

- **Base of the gross physical body** – **“Panchapootham”**
- **Base of the subtle physical body** - **“Tri humors”**
- **Base of the soul body (causal body)** - **“Parabrama”**

According to Siddhar’s view:

The 96 Basic Factors are located in the human body in the view of **soul-mind-body** constitution. When the sperm fertilize the ovum, the human embryo have the 96 Basic factors and is developed by the Functioning of “Tri-humors” physiologically.

- Vali Predominant for 33.4 years.
- Azhal predominant for 33.4 years.
- Iyyam predominant for 33.4 years

100 years

Tri-humors Theory:

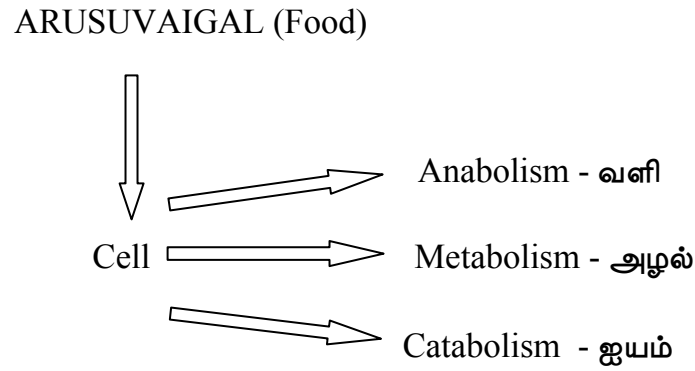
Vali means \Rightarrow Dynamic Force
(or)
Creative Force
(or)
Motivative Force

Azhal means \Rightarrow Static Force
(or)
Metabolic Force

Iyyam means \Rightarrow “Which hold things
together”
(or)
“Provide Substance”
(or)
“Destructive Force”

These three functional energies working in the body through six vital points i.e., called “ATHAARAS”. Six vital points in our body having the capacity of secreting hormonal substances, and these hormonal substances are working in cellular level. That means Vali, Azhal, Iyyam activities. Hence the food products (ARUSUVAIGAL) metabolized, and again three types of humors are formed.

Metabolic level:



Finally the humors derived as 1:1/2:1/4

SIDDHA PATHOLOGY

“நோய் நாடி நோய் முதல் நாடி அதுதணிக்கும்

வாய்நாடி வாய்ப்பச் செயல்”

--திருக்குறள் 948

“உற்றான் அளவும் பிணியளவும் காலமும்

கற்றான் கருதிச் செயல்”

--திருக்குறள் 949

“மதித்திடற் கருமை வாய்ந்த மாண் பரிகார மெல்லாம்

துதித்திட வுணர்ந்தானேனு துகளறப் பிணியின்றன்மை

பதித்திட வுணரானாகிற் பயனுறா னாகலானே

விதித்திடு பிணித் திறத்தை விளம்புது முதற்கண்முன்னே”

- சிகிச்சா ரத்ன தீபம்

The above lines indicate the importance of pathological and diagnostic knowledge than Drug knowledge.

Origin and Development of the Disease:

Dietary changes Micro organisms Suppression of
Reflexes

Seasonal changes Genetic factors Immoral activities

Environmental changes Immunological causes Social Factors

[Soul – Mind – body]



Reflected

Anatomical - Pathology



In correct “7 Thatus”

Patho - Physiology



In correct “Tri humors”

Patho-psychology



Incorrect

“Thrigunas”

1. Saaram

2. Senneer

3. Oone

4. Koluppu

5. Enpu

6. Moolai

7. Sukkilam

Vali Thosam

Azhal Thosam

Iyya Thosam

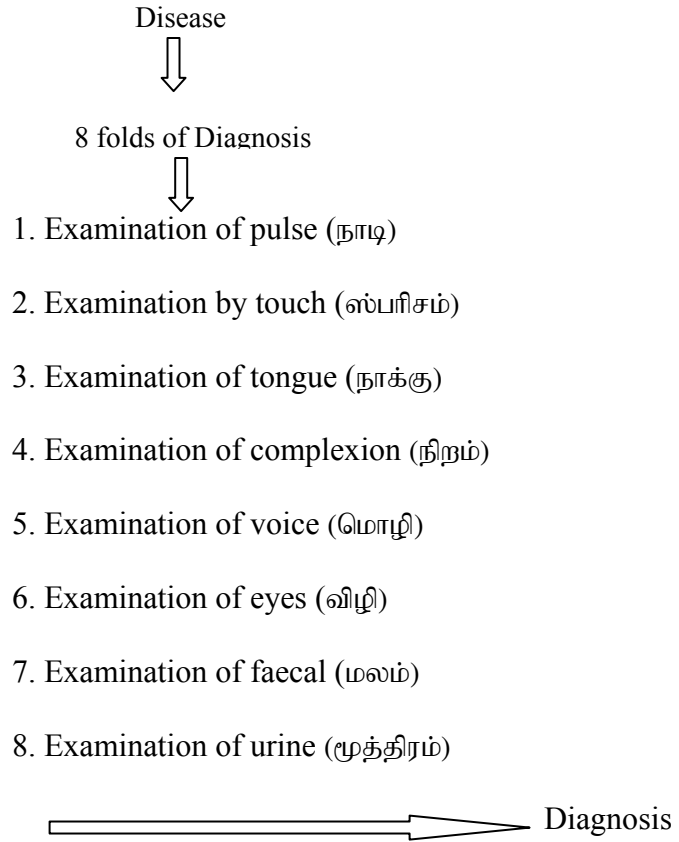
Sathuvam

Rajotham

Thamo

Disease





Basic causes for pathology are three types.

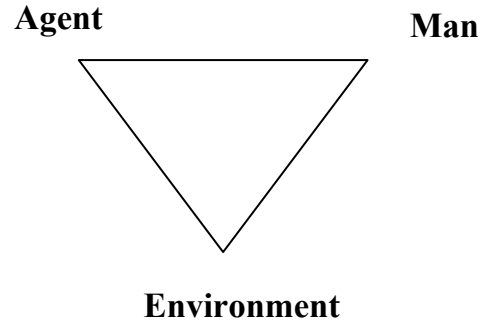
- ❖ **Exogenous Causes.**
- ❖ **Endogenous Causes.**
- ❖ **Psychological Causes.**

The pathological lesions are reflected as three types.

- ❖ **Anatomical pathology** ⇒ **Changes in “7 thatus”**
- ❖ **Patho-physiology** ⇒ **Changes in “Tri-humors”**
- ❖ **Patho-psychology** ⇒ **Changes in “Thri-gunams”**

Nature of the Disease:

Diseases results from complex interaction between man, agent and the environment.



Agent \Rightarrow Biological, Nutrient, physical, chemical, mechanical, social agents etc.

Man \Rightarrow Demographic characters, Biological, genetic characters, Immunological characters life style changes, social, economical etc.

Environment \Rightarrow Seasonal characters (**PARUVAKAALAM**) - பருவ காலங்கள்
Type of Living palces (**THINAIGAL**) - திணைகள்
Astro-climatical, Biological, Psycho-Environmental, etc.....

These factors affect the **soul-mind-body** constitution and Reflected as anatomical, physiological and psychic lesions. Hence the patients suffered from Disease and clinical Diagnosis through by 8 fold of Examination in siddha aspect.

Relationship between “7 Thathus and Dhosas”:

Thathus \Rightarrow Denotes structural components.

Dhosas \Rightarrow Denotes functional components.

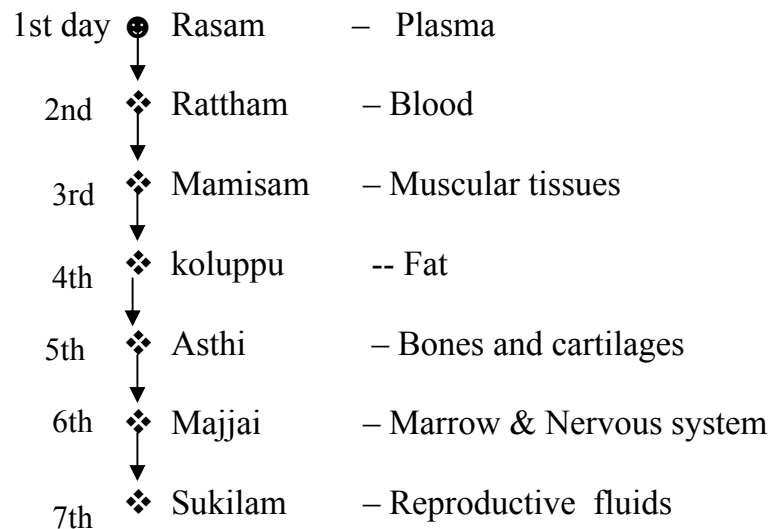
Gunams \Rightarrow Denotes characteric components.

UDAL THATHUS:

When the food materials digested, they are absorbed as saaram.

7 Thathus:-

When food enters:



If there is any alteration in the process, first Reflected as Vatha Diseases and associated with other two humors like pitha, and kapha respectively.

Because vatha Diseases comes under “**Asta Maharogas**”.

1) Saaram (Rasam)

Rasam is the essence of Digested food, and circulated all over the body by “Vyana Vayu”. The main Function of Rasam is Nourishing and production of blood.

➤ Increased State:

It indicates provoked Iyyam symptoms like

1. Excessive salivation
2. Anorexia
3. Body ache, Cough, Excessive Sleep. etc...

Decreased State:

- Wasting of muscles
- Sound intolerance
- Generalized weakness etc.

2) Senneer (Rattham)

Rattham is produced from Rasa thathu. It is responsible for sustenance of life and provides color and complexion to the skin.

Increased State

- Haemangiomas
- Splenomegaly
- Leprosy
- Jaundice
- Mental Disorders

- Blood disorders
- Hyper pigmentation

Decreased State:

- Anaemia
- Dry skin
- Nervous weakness
- Desire for sour foods

3) Oone (mamisam)

It means, they are muscular tissue in the body. It produced from Rattham.

Increased State:

- Tumours
- Carcinoma
- Goitre
- Cyst
- Musculature

Decreased State:

- Wasting
- Dryness
- Cracking sound in joints etc.

4) Koluppu (Medas)

It means, circulated fat (lymph) and Deposited fat (Adipose tissue).

Increased state:

- Associated with mammary Disorders, like tumours.
- Obesity
- Increased musculature with deposition of fatty tissue.
- Hypercholesterolemia.

Decreased state:

- ❖ Wasting of muscles.
- ❖ Decreased stability of Hip joint and other joints.
- ❖ Lethargy (or) sluggishness.

5) Enpu (Asthi)

It indicates bones and cartilages, and gives the structural frame work to the body.

Increased State:

- Hypercalcinosis
- Extra tooth formation.
- Hypertrophy of bone.

Decreased State:

- Osteoporosis
- Rickets

6. Moolai (Majjai)

It denotes Bone marrow, nerves, grey and white matter of central nervous system (Nervous tissue)

Increased State:

- Bone and joint Diseases.
- Ulcers.
- Feeling of heaviness in eyes and body.

Decreased State:

- Demyelination
- Osteomyelitis
- Delusion
- Giddiness

7) Sukra Thathu (Sukkilam)

It denotes reproductive fluids of both male and female.

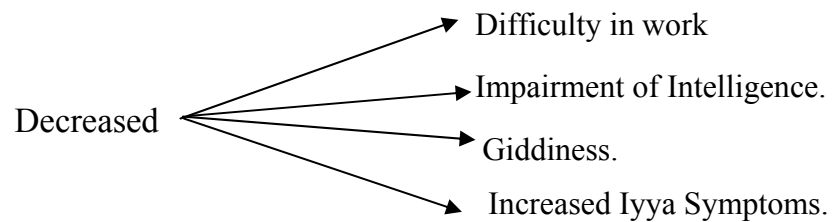
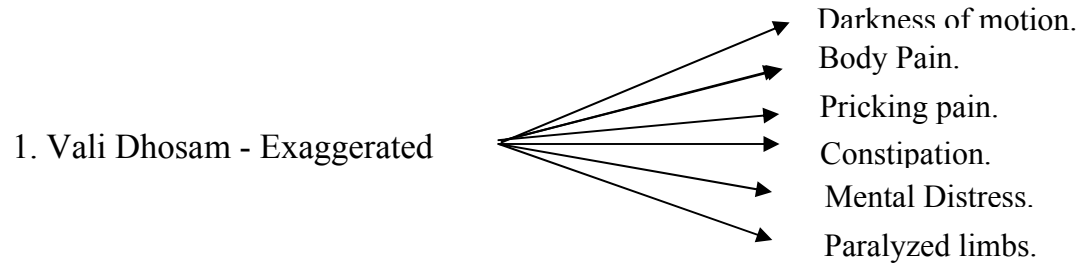
Increased State:

- ❖ Stone – in urethra
- ❖ Increased sexual Desire

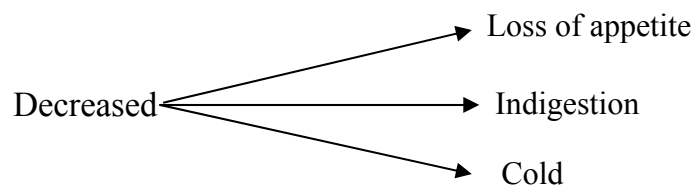
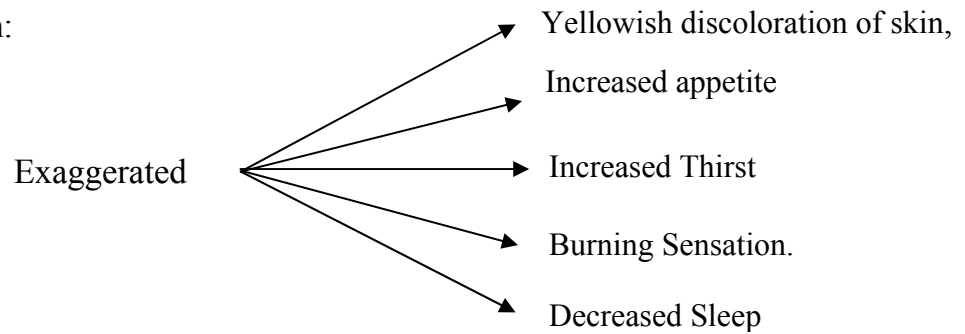
Decreased State:

- ❖ Impotency
- ❖ Infertility
- ❖ Weakness

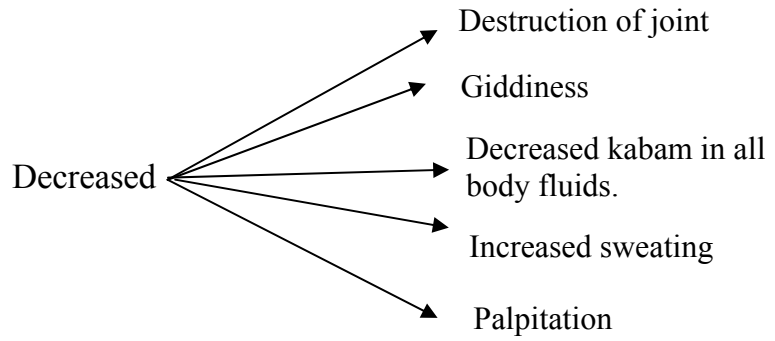
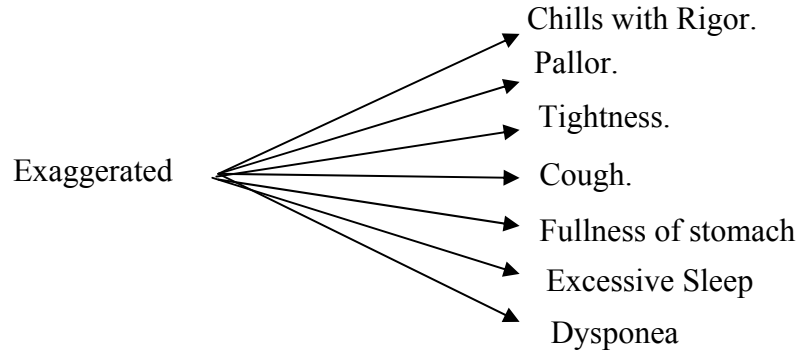
Correlation with Tri-humors:



2. Azhal Dhosam:



3. Iyya Dhosam:

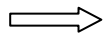


SEASONAL VARIATION (PARUVAKAALAM):

“All three humors Disturbed”

1. Kaarkalam

(கார்காலம்)



Vali → Aggravated

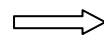
Azhal → Accumulated

(ஆவணி, புரட்டாசி)

Iyyam → Slightly changes

2. Koothirkaalam

(கூதிர்காலம்)



Vali → Normal

Azhal → Aggravated

(ஐப்பசி, கார்த்திகை)

Iyyam → Normal

3. Munpani Kaalam

(முன்பனி காலம்) \Rightarrow “All are neutralized”

(மார்கழி, தை)

4. Pinpani Kaalam

(பின்பனி காலம்) \Rightarrow Iyyam \rightarrow Accumulated

(மாசி, பங்குனி)

5. Elaveanir kaalam

(இளவேனிற் காலம்) \Rightarrow Iyyam \rightarrow Aggravated

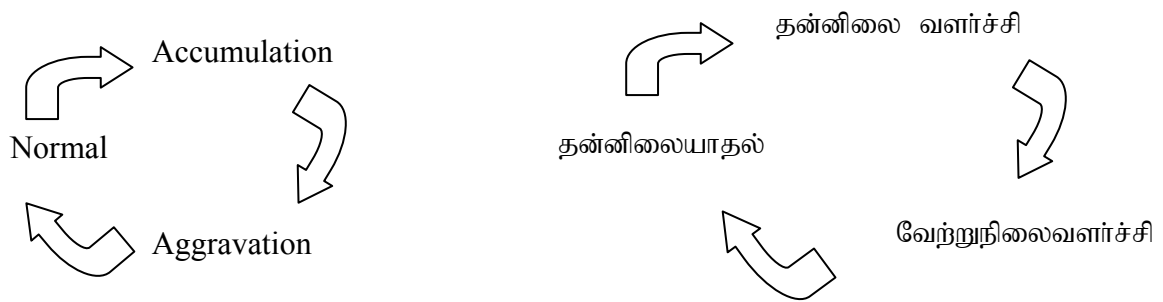
(சித்திரை, வைகாசி)

6. Muthuvenir Kaalam

(முதுவேனிற் காலம்) \Rightarrow Iyyam \rightarrow Normal

(ஆனி, ஆடி) Vali \rightarrow Accumulated

The routine -- This is happening in our body corresponds with paruvakaalam



Environmental Changes – Living places:

There are 5 types of places in siddha aspect.

1.Kurinchi ⇒ Iyyam accumulated, Anaemic fever, abdominal mass may
(குறிஞ்சி) develop.

2.Mullai ⇒ Vali Diseases.
(முல்லை) Azhal Diseases

3.Marutham ⇒ Place for live
(மருதம்) .

4.Neithal ⇒ Vali Diseases, Liver enlargement, Flatulence,
(நெய்தல்) Anda rogams

5.Paalai ⇒ Place for lot of Diseases.
(பாலை)

AIM AND OBJECTIVE

The aim of the present work is to do a realistic contribution to the development of pathological and diagnostic modes of research of the condition “**MUZHANKAAL VAATHAM**” which is one of the 80-types of Vaatham mentioned in siddha literatures.

This is done in reference to the Udal thathuvam, type of vitiation of three-thathus (VAI) and explore details present in various siddha texts and bring about an ideal definition, aetiology, classification, symptomatology and pathology etc of the disease.

The study also aims at clinically observing the incidence of the disease in relation to age, sex, occupation, dietary habits and other habits.

A sincere trial is made using Envagai thaervugal to find out how far it is useful in diagnosing “**MUZHANKAAL VAATHAM**”.

If, by this study, the exact pathological state of “**MUZHANKAAL VAATHAM**” (as a disease entity) is fixed, then it is easy to select the specific drugs from a large number of therapeutic drugs mentioned and available in siddha literature.

INTRODUCTION ABOUT DISSERTATION TOPIC

In siddha medical literatures, the classification and description of the disease conditions under the heading VAATHA NOIGAL numbering about 80 (with slight variations in different texts regarding the number 80) is found in the following sources;

1. YUGI VAITHIYA CHINTHAMANI-800
2. YUGIMUNI VAITHIYA KAAVIYAM-12,000, PART-1
3. THAERAIYAR VAAGADAM
4. AGATHIYAR AYUL VETHAM-1200
5. AGATHIYAR MANI 4000 aka VAITHIYA CHINTHAMAI VENPA-4000
6. SARABENTHIRAR VAITHIYA MURAIGAL-VATHAROGA CHIKITCHAI
7. PARA RAASA SEKARAM –VATHA ROGA NOTHANA CHIKITCHAI

But it is observed that in 80 types of VATHA NOIGAL, the name shows some differences (in terminology). In some texts, the names are identical and in others, total changes of names are observed.

The following is a list of joint related (articular) disease conditions where systemic involvement is also mentioned

1. KAI MUDAKKU VATHAM
2. KAAL MUDAKKU VATHAM
3. MOOTTU VATHAM
4. MUDANGU VATHAM
5. NARITTHALAI VATHAM
- 6. MUZHANKAAL VATHAM**
7. KANAICKAAL VATHAM
8. PORUTTHU VATHAM
9. SANTHU VATHAM
10. ARAIYIL SANTHU VATHAM
11. SANTHU SOOLAI VATHAM
12. UTHIRA VATHA SURONITHAM
13. PAYITHIYAVATHA SURONITHAM
14. ASTHI VATHAM
15. SOOLAI VATHAM
16. MAEGA VATHAM
17. BRAMAEGA VATHAM
18. MUDAKKU VATHAM
19. SURONITHA SILETPAM

A deep study of the description in verses reveals that, in most of the above disease conditions, besides the joint involvement, other parts of the body are affected leading to a mixed type of symptoms and signs and hence the causative factors.

But, out of the above 18 conditions, about six disease entities, the description and reference is specifically confined to the knee joint or knee joints only. They are;

1. NARI VATHAM

“நடந்திடின் முழங்கால் வீங்கி நடுக்கென குத்தி வாங்கித்
துடர்ந்துடன் பிடித்து மிண்டித் துடித்துடனடுக்கமுண்டாம்
அடர்ந்திடும் வயிற்று நோவா யதிகமாய்த் திரண்டேயேறும்
படர்ந்திடு நரிவாதத்தின் குணமெனப் பகர்ந்தாரன்றே”

- பரராச சேகரம் வாதரோகம், பாடல் 209.

2. NARIT THALAI VATHAM

“மூர்க்கமா முயன்று முழங்கால்தான் வீங்கி முதிர்ந்து ரத்தமுந்திரண்டு முயற்சியாகி
நீக்கமாய் நின்றிட வொணாமற் தானும் நிமிர்ந்திடுகில் சந்துதான் முடக்கொணாமல்
தீர்க்கமாய் துண்டித்து மிகச்சிக்கென்று செழுமை நரித்தலைபோலே மிகவே வீங்கி
நார்க்கமாய் நாடியுமே படபடக்கும் நரித்தலையின் வாதமென்றே நவிலலாமே”

- யூகி வைத்திய சிந்தாமணி 800, பாடல் 263

3. UTHIRA VATHA SURONITHAM

“வைகிதமாய்க் கணைக்காலு முழங்கால் தானும் மற்கடாஞ்சந்து புறவடியும் வீங்கிச்
செய்கிதமாஞ் சிறுவிரல்கள் மிகவும் நொந்து சிந்தை தடுமாறியே சலிப்புண்டாகும்
பைகிதமாம் தடுமாறியே சலிப்புண்டாகும் பாரமாய் உற்பவித்து அழலுண்டாகும்
உய்கிதமாம் அசனது தானும் வேண்டா உதிரவாதச்சுரோணிதத்தி னுணர்ச்சியாமே”

- யுகி வைத்திய சிந்தாமணி 800, பாடல் 319

4. PAYITHIYA VATHA SURONITHAM

“உணர்ச்சியாய்ச் சுரோணிதந்தான் மிகவெதும்பி ஊக்கமாய்த்தேகமெங்கு மிகவேநொந்து
முணர்ச்சியா முழங்கால்கள் முழங்கையொக்க முனையான சிறுவிரல்கள் கன்னம்நெற்றி
தணர்ச்சியாய்ச் சந்து சருவாங்கமெங்கும் தாட்டிகமாய்க் குடைந்து சுரமுமுண்டாம்
பணர்ச்சியாய்பாண்டதுபோன்மேனியாகும் பயித்தியவாதசுரோணிதத்தின் பண்புதானே”

- யுகி வைத்திய சிந்தாமணி 800, பாடல் 320

5. MAEGA VATHAM

“முடக்கியே முழங்கால் வீங்கு முதிர்சல மோராய் வீழும்
தடக்கியே நடைகொடாது தந்துபோற் சியலுமுண்டாம்
விடக்கயல் வடுமானம்பு வேலென மிளிருங்கண்ணாய்
மடக்கிய மேகவாதஞ் செய்குணம் வகுக்கலாமே”

- பரராச சேகரம் வாதரோகம், பாடல் 197

6. SURONITHA SILETPAM

“உண்மையாய் முழங்காலில் மிககுக்கடந்து உளைந்துமே முதுகோடு விலாப்பக்கங்கள்
கண்மையாய் முழங்கைகள் முழங்கைச்சந்து கடினமாய் வீங்கியே குடைச்சலுண்டாம்
தண்மையாய் சளிக்கட்டுந் தாகமாகும் சாதகமாய் இருமியே மூச்சுண்டாகும்
திண்மையாய் நாவரண்டு தித்திப்பாகும் செயமான சுரோணித சிலேட்பந்தானே”

- யுகி வைத்திய சிந்தாமணி, பாடல் 415

7. MUZHANKAAL VATHAM

“திரண்டிடு முழங்கால் வீங்கிச் சேர நொந்துளைந்து குத்திப்
புரண்டிட மடக்கி மிண்டிப் போதவே நடைகொடாது
மருண்டுவேல் கணைமானம்பு வாளென மிளிருங்கண்ணாய்
முரண்டரு முழங்கால் தன்னின் மொழிந்துடு வாதமாமே.”

- பரராசசேகரம்--பாடல்எண்:182

In the above cited verses, MUZHANKAAL VATHAM is clearly dealt specifically with the mono-arthritis of knee joint. Moreover, in Tamilnadu MUZHANKAAL VATHAM is a common term used in day-to-day life by people to refer to this condition. Taking into consideration all these factors it is proposed to select the knee joint affliction as the subject matter for the present dissertation.

Three following books also describe and deal with the same condition;

a) AGATHIYAR AYUL VETHAM -1200

“முழங்கால் வீங்கிக் கடுத்து நொந்து மோதித்திரண்டு வேதனையாய்

வழங்காதென்ன நடைகட்டு வருத்தமிகவுந் தானுமுண்டாய்”

- அகத்தியர் ஆயுள்வேதம் 1200, பாடல் 296

b) THAERAIYAR VAAGADAM

“முழங்கால் வாதங்கனத்து வீக்கமாகி முசியாமல்

கடுத்து நடக்கொட்டாதென்று”

- தேரையர் வாகடம், பாடல் 217

c) PARA RASA SEKARAM-VATHA ROGA NITHANA CHIKITCHAI.

“திரண்டிடு முழங்கால் வீங்கிச் சேர நொந்துளைந்து குத்திப்

புரண்டிட மடக்கி மிண்டிப் போதவே நடைகொடாது

மருண்டுவேல் கணைமானம்பு வாளென மிளிருங்கண்ணாய்

முரண்டரு முழங்கால் தன்னின் மொழிந்து வாதமாமே.”

- பரராசசேகரம்--பாடல்எண்:182

This topic for dissertation is based on PARA RASA SEKARAM-VATHA ROGA NITHANA CHIKITCHAI. In PARA RASA SEKARAM, vaatham-80 is classified as 40-conditions above the waist and remaining 40-conditions below the waist based on body regions involved. The waist line is kept as a basic dividing line. Perhaps, this may be due to the degree of movement and weight bearing of joints below the waist.

The word “MUZHANKAAL” means knee joint, and “VATHAM” means affliction and impairment in function. The pathological changes are confined to knee joint (weight bearing joint) only.

In the knee joint, whatever the cause, the ongoing pathogenesis it is in two ways; one is degeneration and the other is inflammation. Any inflammatory knee pathology is followed by degenerative pathology. In some conditions mainly degenerative changes predominate with minimal inflammation. So the condition MUZHANKAAL VATHAM indicates only knee joint pathology and has the features of joint swelling, pain (aching, stabbing, throbbing) and late deformity.

READING LINES BETWEEN THE POEM

In *Para Rasa sekaram-vaatha roga nithana sikitchai*, “MUZHINKAAL VAATHAM” is dealt in the stanza 182 as follows;

முழங்கால் வாதம்

“திரண்டிடு முழங்கால் வீங்கிச் சேர நொந்துளைந்து குத்திப்
புரண்டிட மடக்கி மிண்டிப் போதவே நடைகொடாது
மருண்டுவேல் கணைமானம்பு வாளென மிளிருங்கண்ணாய்
முரண்டரு முழங்கால் தன்னின் மொழிந்துடு வாதமாமே.”

பரராசசேகரம்--பாடல்எண்:182

The meaning of the words in this poem is as follows;

- | | |
|--------------------|---|
| ➤ திரண்டிடும் | - Round shaped gathering of |
| ➤ முழங்கால் வீங்கி | - swelled knee joint |
| ➤ சேர | - bone ends are coming close and together |
| ➤ நொந்து | - degeneration , destruction |
| ➤ உளைந்து | - gripping pain |
| ➤ குத்தி | - pricking pain / Boring pain / piercing pain |
| ➤ புரண்டிட | - twisting in knee joint (deformity) |
| ➤ மடக்கி | - flexion / bending in knee joint (deformity) |
| ➤ மிண்டி | - jostling / struggling / crowdness |
| ➤ போதவே | - so |
| ➤ நடை | - normal knee functions like walking etc. |
| ➤ கொடாது | - not allow / not permit. |

“திரண்டிடும் முழங்கால் வீங்கி”

- முழங்காலில் என்புகள் ஒன்றாக திரண்டு உருண்டை வடிவமாக வீங்கி காணும்

“சேர நொந்து”

- மூட்டு எலும்புகள் பதனழிந்தநிலையில் ஒன்றோடொன்று நெருங்கி சேர்ந்திருக்கும்

“உளைந்து குத்தி”

- முதலில் முழங்காலில் உளைச்சல் காணும். பின்னர் குத்தல் வலி காணும்

“புரண்டிட மடக்கி”

- நீட்டிக்கொண்டிருக்கும் முழங்கால் மூட்டு, பக்கவாட்டில் பிறழ்ந்து, குறிப்பிட்ட ஒரு நிலையில் மடங்கி மாறுபாடு அடையும்.

“மிண்டி போதவே”

- மூட்டுக்குள் எலும்புகளின் முனைகள் (மல்லுக்கட்டி) தள்ளிக்கொண்டு

“நடைகொடாது”

- இயல்பான நடத்தல் தொழிலை முழங்கால் கொடுக்காது.

The above lines are summarized as follows;

These lines clearly show the degenerative pathogenesis of the knee joint. Due to the degeneration of knee joint;

- Knee swelling is round in shape due to gathering of bone ends into a mass
- There is degeneration and the bone ends are very close to each other
- Initial gripping pain is followed by stabbing pain
- There is twist-cum-flexion deformity due to forward jostling of the knee joint.

EVALUATION OF THE DISSERTATION TOPIC

A) MATERIALS AND METHODS:

The pathological evaluation of the disease “MUZHANKAAL VAATHAM” was carried out in out-patient as well as in-patient departments at Government siddha medical college & hospital, Palayamkottai during the year 2006-2007.

SELECTION OF CASES:

20 cases with similar symptoms of “MUZHANKAAL VAATHAM” were selected from OP & IP Departments of Government siddha Medical College, Palayamkottai, and followed by the author whose work was under the close supervision of the professor and lecturer of the post –graduate Noi-Naadal Department.

EXCLUSION CRITERIA:

In addition to “MUZHANKAAL VAATHAM”, patients whoever having other clinical symptoms like, multi-joints pain other than knee joint, other systemic diseases like Diabetes mellitus, hypertension, respiratory diseases and cardiac diseases were carefully excluded from the study.

EVALUATION OF CLINICAL PARAMETERS:

- Detailed history of present and past illness
- Family history
- Personal history
- Occupational history
- Socio-economic status
- Dietary habits.
- Seasonal variations.

SYMPTOMS AND SIGNS OF “MUZHANKAAL VAATHAM”

- Rounded swelling of knee
- Gripping pain
- Stabbing pain
- twist-cum-flexion deformity

SIDDHA CLINICAL DIAGNOSIS:

Envagai thaervugal (8 tools of Diagnosis):

1. Examination of Naadi.
2. Examination by touch.
3. Examination of the tongue.
4. Examination of complexion.
5. Examination of voice.
6. Examination of the eyes.
7. Examination of the stool.
8. Examination of the urine.

MODERN INVESTIGATION:

The following Hematological parameters are done

- TC - Total Count
- DC - Differential count
- ESR - Erythrocyte sedimentation rate
- Hb - Haemoglobin estimation
- Blood sugar
- Blood urea
- Serum cholesterol

Routine Urine Analysis:

- Albumin
- Sugar
- Deposit

X-ray Report:

- Both knee joint – AP view & Lateral view.

CASE PROFORMA:

All clinical signs and symptoms of “**MUZHANKAAL VAATHAM**”, History of present illness, past illness, personal history, Family history, derangement of mukkutram, and udal thathus, laboratory investigations, and X-rays were systematically recorded in the proforma.

LIST OF SELECTED CASES:

S.NO	OP/IP. NO	NAME	AGE/SEX
1	OP.74162	PONNU SAMY	58/M
2	OP.76358	JEYAMERY	60/F
3	OP.75847	REETHA	60/F
4	OP.1403	PONNU SWAMY	50/M
5	IP.2885	XAVIOUR	61/M
6	IP.93	MURUGAMMAL	50/F
7	IP.96	PAPPATHY	50/F
8	IP.104	MOOKKA PILLAI	72/M
9	IP.76	SINNA THAMBI	64/M
10	IP.2867	KUPPU SAMY	55/M
11	IP.2944	LAKSHMI	60/F
12	IP.31	VALLA THAAI	65/F
13	IP.101	RAHMATH BEEVI	50/F
14	IP.46	PONNU THAAI	50/F
15	IP.319	PICCHAMMA	55/F
16	IP.113	MUTHU LAKHSMI	60/F
17	IP.291	LILLY PUSPHAM	55/F
18	IP.426	MAANIKKAM	55/M
19	IP.564	SUBBAIYA	65/M
20	IP.162	MUTHU PANDIYAN	42/M

B) OBSERVATION AND RESULTS:

1. AGE:

S.No	Age	No. Of Cases	Percentage
1	40 – 50	6	30%
2	51 – 60	9	45%
3	61 – 70	4	20%
4	71 – 80	1	5%

Among the selected 20 cases, the incidence of disease was found to be higher in the age groups between 51 to 60 (45%).

2. SEX:

S.No	Sex	No. Of Cases	Percentage
1	Male	9	45%
2	Female	11	55%

The incidence of disease was found to be higher in females (55%).

3. FAMILY HISTORY:

S.No	Family history	No. Of Cases	Percentage
1	Positive	18	90%
2	Negative	2	10%

There is a strong family history for this disease (90%).

4. OCCUPATION:

S.No	Occupation	No. Of Cases	Percentage
1	White-collars	1	10%
2	Blue-collars	17	80%
3	House wives	2	10%

Hard / coolie workers have more incidence of disease. (80%)

5. SOCIO-ECONOMIC STATUS:

S.No	Socio-economic status	No. Of Cases	Percentage
1	Rich	-	-
2	Middle class	8	30%
3	Poor	12	70%

Among the studied cases, more number of cases belong to poor socio-economic status (70%).

6. KAALAM (LIFE SPAN):

S.No	Kaalam	No. Of Cases	Percentage
1	Vaatha kaalam (upto 33yrs)	-	-
2	Pitha kaalam (33 – 66 yrs)	19	95%
3	Kaba kaalam (above 66 yrs)	1	5%

Out of 20 cases, 95% of cases were found to be in Pitha kaalam i.e. age between 33 to 66 years.

7. SEASONAL VARIATIONS (PARUVA KAALAM) :

S.No	Paruva kaalam	months	No. Of Cases	Percentage
1	Kaar kaalam (aavani - purattasi)	Aug 15 – oct 14	-	-
2	Koothir kaalam (iypnasi – kaarthigai)	Oct 15 – dec 14	2	10%
3	Munpani kaalam (maargaxhi –thai)	Dec 15 – feb 14	16	80%
4	Pinpani kaalam (Maasi – panguni)	Feb 15 – apr 14	1	5%
5	Ilavenil kaalam (chitthirai – vaigaasi)	Apr 15 – jun 14	-	-
6	Muthuvenil kaalam (aani - aadi)	Jun 15 – aug 14	1	5%

Most of the cases were coming to get treatment during December to February time i.e. munpani kaalam.

8. THINAI (GEOLOGICAL DISTRIBUTION):

S.No	Thinai	No. Of Cases	Percentage
1	Kurinchi	-	-
2	Mullai	2	10%
3	Marutham	16	80%
4	Neithal	2	10%
5	Paalai	-	-

Most of the cases were reported from marutha nilam (80%).

9. DISTURBANCES OF VALI (VAATHAM) :

S.No	Vali	No. Of Cases	Percentage
1	Viyaanan	20	100%
2	Praanan	-	-
3	Abaanan	15	75%
4	Samaanan	20	100%
5	Uthaanan	-	-
6	Naagan	-	-
7	Koorman	-	-
8	Kirukaran	-	-
9	Devathathan	-	-
10	Thananjeyan	-	-

Viyaanan and samaanan were affected in almost all the cases while abaanan was affected in 75% of the cases.

10. DISTURBANCES OF AZHAL (PITHAM):

S.No	Azhal	No. Of Cases	Percentage
1	Anarpitham	-	-
2	Ranjagam	15	75%
3	Praasagam	-	-
4	Aalosagam	-	-
5	Saathagam	20	100%

Santhigam was affected in almost all the cases, while ranjagam was affected in 75% of cases.

11. DISTURBANCES OF IYYAM (KABAM) :

S.No	Iyyam	No. Of Cases	Percentage
1	Avalambagam	-	-
2	Kilethagam	-	-
3	Pothagam	-	-
4	Tharpagam	-	-
5	Santhigam	20	100%

Santhigam was found to be affected in almost all the cases.

12. UDAL KATTUGAL (UDAL KATTUGAL) :

S.No	Udal kattugal	No. Of Cases	Percentage
1	Saaram	20	100%
2	Senneer	15	75%
3	Oon	20	100%
4	Kozhuppu	-	-
5	Enbu	20	100%
6	Moolai	-	-
7	Sukkilam	-	-

Saaram, Oon and enbu were affected in almost all the cases, while senneer was affected in 75% of cases.

13. ENVAGAI THAERVUGAL:

S.No	Envagai thaervugal	No. Of Cases	Percentage
1	Naa	15	75%
2	Niram	-	-
3	Mozhi	-	-
4	Vizhi	-	-
5	Malam	15	75%
6	Moothiram	-	-
7	Naadi	20	100%
8	Sparisam	-	-

Naadi was altered in almost all the cases, whereas naa and malam were affected in 75% of cases.

14. NEIK-KURI (URINE-OIL DIAGNOSIS) :

S.No	Shape of oil	No. Of Cases	Percentage
1	Vatha neer-snake like	-	-
2	Pitha neer-ring like	20	100%
3	Kaba neer-pearl like	-	-
4	Kalappu - thontham	-	-

In nei-kuri, all urine indicated pitha neer i.e. ring like appearance.

15. BODY MASS INDEX

S.No	OP/IP No	Weight in Kg	Height in Meters	Body Mass Index BMI = wt / (ht) ²	BMI Ranges
1	OP.74162	55	1.58	22.08	Acceptable
2	OP. 76358	60	1.65	22.20	Acceptable
3	OP. 75847	55	1.57	22.35	Acceptable
4	OP. 1403	60	1.50	26.66	Over weight
5	IP. 2885	72	1.64	26.86	Over weight
6	IP. 93	55	1.58	22.08	Acceptable
7	IP. 96	60	1.65	22.20	Acceptable
8	IP. 104	70	1.63	26.41	Over weight
9	IP. 76	72	1.64	26.86	Over weight
10	IP. 2867	60	1.50	26.66	Over weight
11	IP. 2944	55	1.48	25.11	Over weight
12	IP.31	55	1.58	22.08	Acceptable
13	IP. 101	60	1.65	22.20	Acceptable
14	IP. 46	72	1.64	26.86	Over weight
15	IP. 319	55	1.57	22.35	Acceptable
16	IP. 113	70	1.55	29.16	Over weight
17	IP. 291	72	1.64	26.86	Over weight
18	IP. 426	65	1.48	29.60	Over weight
19	IP. 564	65	1.55	27.08	Over weight
20	IP. 162	63	1.50	28.00	Over weight

Out of 20 cases, about 60% were found to be over weight (BMI Range 25.00 - 29.90)

BMI ranges :

Acceptable Range : 18.5 - 24.90
Over weight : 25.00 - 29.90
Obesity : 30.00 - 39.90
Morbidly Obese : More than 40

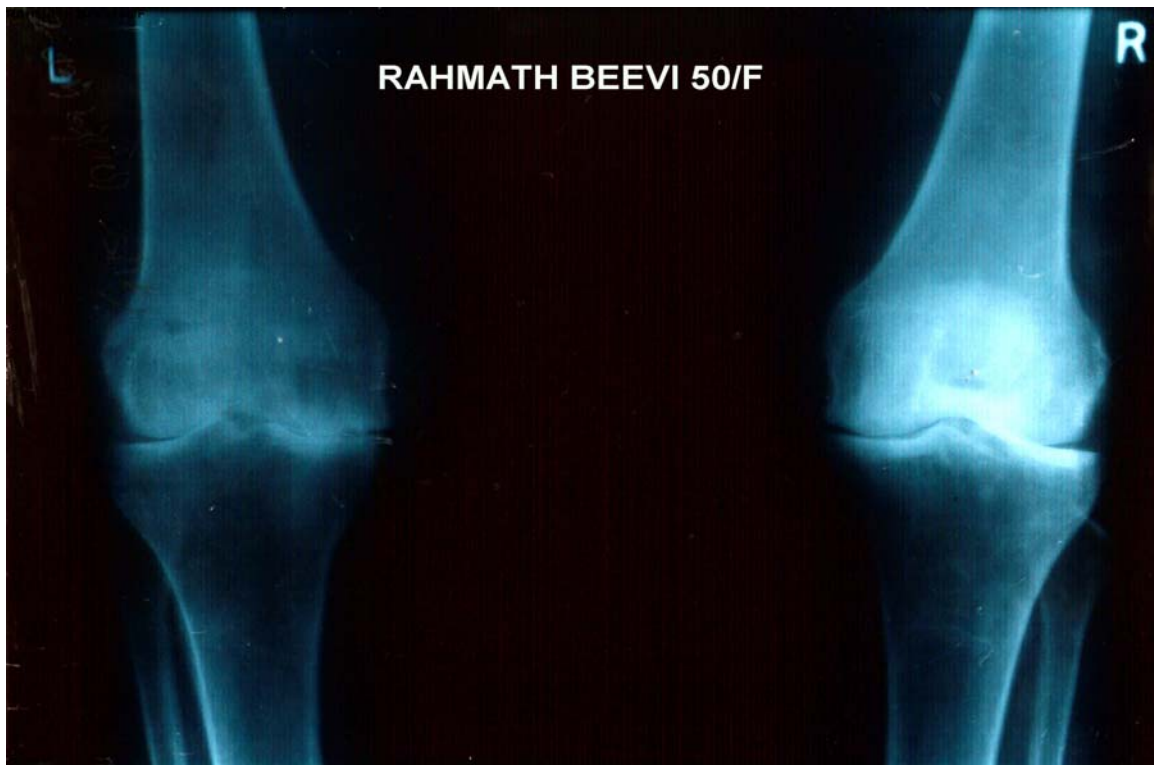


Genu Varus Deformity



Knee joint swelling

PAPPATHY 50 / F



17. X-RAY – KNEE JOINT –AP VIEW & LATERAL VIEW:

Soft tissues and synovial membrane are normal in all X-rays.

Generally, all X-rays have the following findings:

- Narrowed joint space
- Osteophytes

In addition to above findings, each X-ray has one or more of the following findings;

- Intercondular notch prominence
- Subchondral sclerosis
- Loose bodies
- varus deformity

The above X-ray findings indicate the degenerative changes of the knee joint in all cases.

ANATOMY OF KNEE JOINT

The knee joint is the largest and most complex joint of the body. The complexity is the result of fusion of three joints in one. It is formed by fusion of the lateral femorotibial, medial femorotibial and femoropatellar joints. Thus the knee joint is formed by condyles of femur, condyles of tibia and patella. The structures are briefly discussed here.

LIGAMENTUM PATELLAE:

It is the degenerated tendon of insertion quadriceps femoris. It is separated from the synovial membrane of knee joint by the infrapatellar pad of fat.

MEDIAL TIBIAL COLLATERAL LIGAMENT:

It is the degenerated tendon of insertion of adductor magnus muscle.

LATERAL FIBULAR COLLATERAL LIGAMENT:

Laterally, it contains the degenerated origin of the peroneus longus muscle.

OBLIQUE POPLITEAL LIGAMENT:

This is an expansion of insertion of semi-membranous muscle.

ARCUATE POPLITEAL LIGAMENT:

This is a Y-shaped posterior expansion from the short lateral ligament.

CRUCIATE LIGAMENT:

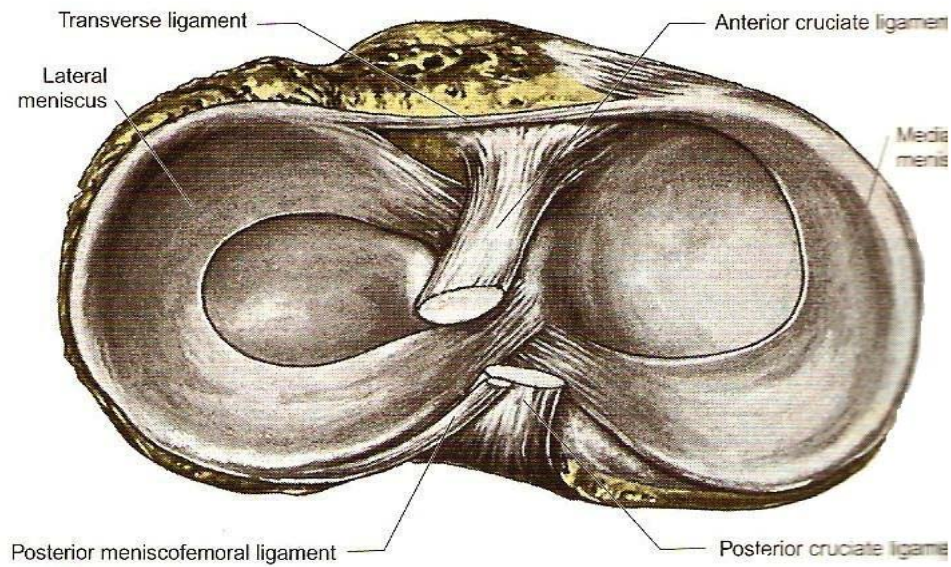
These fibrous bands are intracapsular but extra synovial structures. The anterior and posterior cruciate ligaments cross each other within the joint cavity from intercondylar notch of femur to the intercondylar eminence of tibia to maintain anteroposterior stability of the knee joint.

SEMILUNAR CARTILAGES:

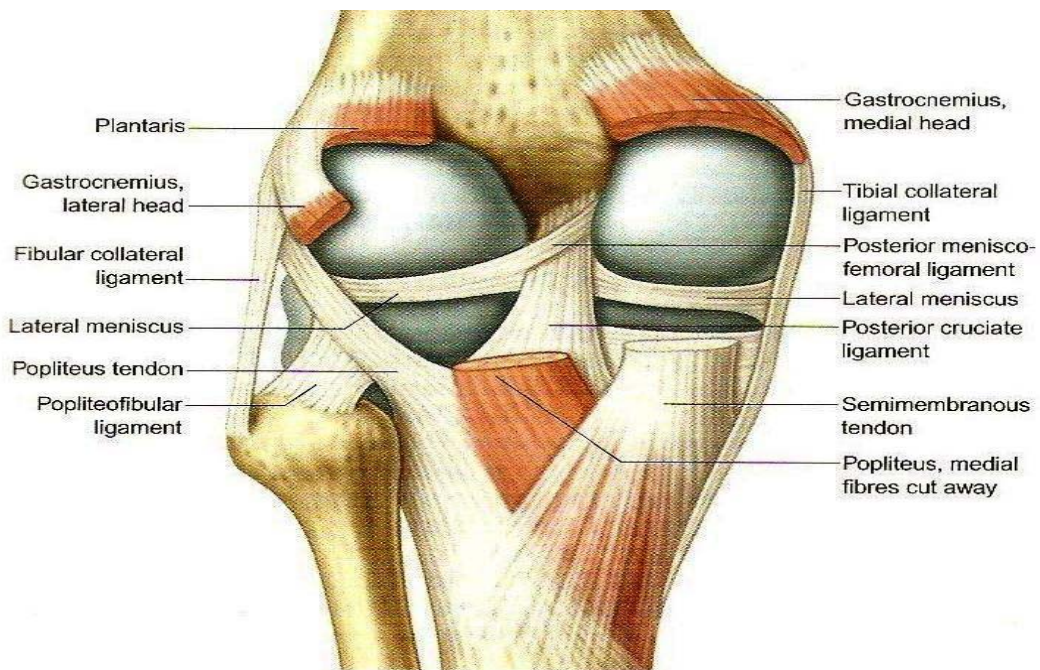
There are two fibrocartilagenous crescentric shaped discs called **menisci** (medial meniscus and lateral meniscus) which deepen the articular surfaces of the condyles of tibia. They stabilize the joint by preventing lateral displacement of bones. Compositional changes occur with ageing and degeneration within the menisci; these reduce the ability to resist tensional forces.

Their peripheral zone is vascularized by capillary loops from the fibrous capsule and synovial membrane, while their inner regions are avascular. Peripheral tears in the vascular zone have the capacity to heal which makes repair a possibility.

The meniscal horns are richly innervated compared with the remainder of meniscus. The central thirds are devoid of innervation. Because of their nerve supply, they also have a sensory function. These menisci are not covered with synovial membrane.



Superior aspect of the left tibia, showing the menisci and the attachments of the cruciate ligaments.



Posterior dissection of the left knee. The fibrous capsule has been removed, exposing the unopened synovial membrane (blue). The synovial cavity has been partially distended by injection.

TRANSVERSE LIGAMENT:

This fibrous tissue connects anterior ends of medial and lateral semilunar cartilages.

SYNOVIAL MEMBRANE:

This lines the inner surface of the capsule except posteriorly where it is reflected towards by the cruciate ligaments. The membrane enters the joint on either sides of the cruciate ligaments and ends of the menisci and making them intracapsular but extra synovial structures. In front, it is prolonged upwards as the supra-patellar bursa.

FIBROUS ARTICULAR CAPSULE:

This capsule is very thin and is deficient anteriorly, where it is replaced by quadriceps femoris, the patella and the ligamentum patellae. The Synovial membrane of the joint extends above the patella through this opening and the extension is called as supra patellar bursa.

BURSAE AROUND THE KNEE:

As many as 13 bursae have been described around the knee; four in anterior, four in lateral and five in medial.

BLOOD SUPPLY:

The knee is supplied by the anastomosis around it. The chief sources are:

- Five genicular branches of popliteal artery
- The descending genicular branch of the femoral artery
- The descending branch of the lateral circumflex femoral artery
- Two recurrent branches of anterior tibial artery
- The circumflex fibular branch of posterior tibial artery

NERVE SUPPLY:

- Femoral nerve
- Genicular branches of common peroneal nerve
- Genicular branches of tibial nerve
- Descending genicular branch of posterior division of the obturator nerve

MICROSTRUCTURES OF KNEE JOINT

To understand the pathogenesis of osteoarthritis, we have a closer look at the embryological, histological and biochemical aspects of articular cartilage.

EMBRYOLOGY OF ARTICULAR CARTILAGE:

Cartilage is also formed from mesenchyme. At a site where cartilage is to be formed, mesenchymal cells become closely packed. This is called mesenchymal condensation. The mesenchymal cells then become rounded and get converted into cartilage forming cells or **chondroblasts**. Under the influence of chondroblasts, the intercellular substance of cartilage is laid down. Some chondroblasts get imprisoned within the substance of this developing cartilage and are called **chondrocytes**. Some fibers also develop in the intercellular substance.

In hyaline cartilage, collagen fibers are present. In fibrocartilage, collagen fibers are numerous and very obvious. Mesenchymal cells surrounding the surface of the developing cartilage form a fibrous membrane, the **perichondrium**.

Cartilage is considered to be a modified connective tissue. Cartilage differs from typical connective tissue mainly in the nature of ground substance which is firm and gives cartilage its characteristic consistency. Articular cartilage of knee joint is lined by **hyaline cartilage**. These articular cartilages provide the bone ends with smooth surfaces between which there is very little friction. They act as shock absorber. Their surface is kept moist by synovial fluid which also provides nutrition to them.

STRUCTURE OF ARTICULAR CARTILAGE:

Hyaline cartilage is so called because it is transparent (hyalos = glass). Its intracellular substance appears to be homogenous. Cartilage lacks blood vessels, lymphatics and nerves. It may have focal areas of calcification

a) **Zone 1 : Superficial stratum / Tangential stratum:**

Near the free surface of articular cartilage, the cells are small and flattened parallel to the surface. This is the first to show changes of osteoarthritis.

b) **Zone 2 : Intermediate stratum / Transitional stratum :**

Just deep to the superficial stratum this layer is seen. In this layer, the cells are larger and more rounded. They may lie singly or in groups.

c) **Zone 3 : Radiate stratum :**

On proceeding towards the deep surface of the cartilage (which is attached to the bone), the cells become still larger and may be arranged in vertical columns.

d) **Deepest calcified layer :**

The deepest layer of the cartilage just next to bone, which separates hyaline cartilage from subchondral bone.

In the knee joint, the *intra-articular disc* or *menisci* are made up of fibrocartilage that acts as shock absorber. Cartilage has very limited ability for regeneration after destruction by injury or diseases. Defects in cartilage are usually filled in by fibrous tissue. The transformation of hyaline cartilage to fibrocartilage is one of the earliest sign of ageing in the body.

BIOCHEMISTRY OF ARTICULAR CARTILAGE:

Cartilage consists of two components; cartilage matrix and chondrocytes.

Chondrocytes:

Primitive mesenchymal cells which form bone cells form chondroblasts which give rise to chondrocytes. However, calcified cartilage is removed by the osteoclasts.

Cartilage matrix:

Like bone, cartilage too consists of organic and inorganic material.

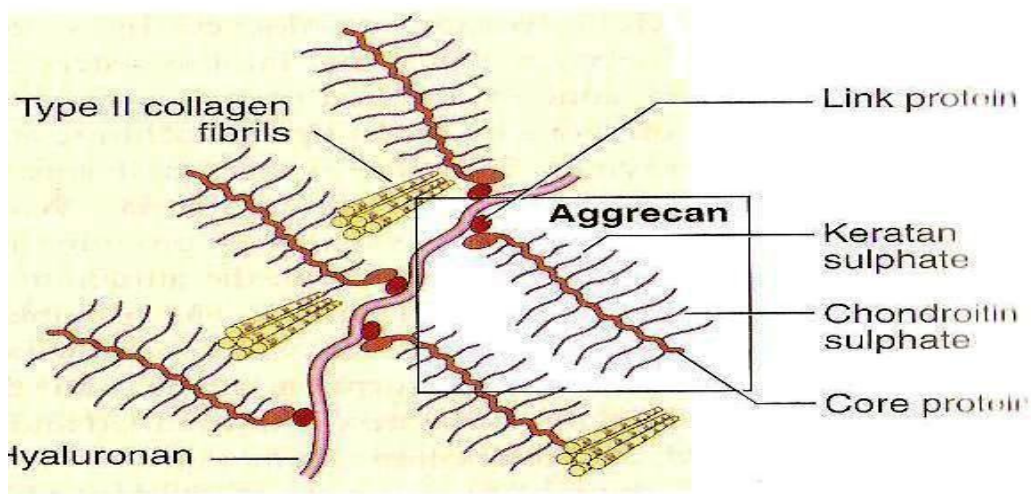
Inorganic material of cartilage is **calcium hydroxypaptite**.

It consists of very high content i.e. 80% of water and remaining 20% consists of type II collagen and proteoglycans.

Proteoglycans:

This is the ground substance of articular cartilage rich in *proteins-carbohydrates* complexes (5:95). These molecules form a meshwork which is filled by water and dissolved salts. The protein is *aggrecan*. The carbohydrates are chemically long chained polysaccharides called *glycosaminoglycans (GAG)*. They include chondroitin sulfate, keratin sulfate and hyaluronic acid. Matrix comprises 55-90% of Chondroitin sulfate varying on age of the cartilage.

With ageing, the concentration of chondroitin sulphate decreases, whereas that of keratin sulphate increases, resulting in a reduction in water content and impairment of cartilage's shock absorbing properties.



Ultrastructure of articular cartilage.

They carry *sulphate groups* (SO_3^-) and *carboxyl groups* (COO^-) which give them a strong negative charges.

The GAGs being poly-ionic, bind cations like *Na* and *K* and attract maximum possible volume of water by osmotic pressure into extra cellular matrix. High water content (80%) of cartilage matrix gives excellent shock-absorbing properties.

In healthy individual, a balance is maintained between synthesis and degeneration of cartilage matrix. Cartilage degeneration is mediated by enzymes such as *matrix metalloproteinases* and *aggrecanase* that degrade the protein and the enzyme *glycosidase* degrade the GAGs side-chain.

The pro-inflammatory cytokines such as *interleukin-1 (IL-1)* and *tumor necrosis factor (TNF)* stimulate the production of these enzymes and promote cartilage degradation. This is offset by up-regulation of *tissue inhibitors of metalloproteinases (TIMP)*, which opposes the effect of degrading enzymes and protect against cartilage degeneration.

SYNOVIAL MEMBRANE:

The joint space is lined by synovial membrane or synovium which forms synovial fluid that lubricates the joint during movement. The synovium may be smooth or thrown into numerous folds or villi. The synovial membrane is composed of an inner layer of synoviocytes and an outer vascular layer.

On electron microscopy, two types of synoviocytes are distinguished; *type A synoviocyte* and *type B synoviocytes*.

Type A – Produces degenerative enzyme and are phagocytic.

Type B – Produces hyaluronic acid and secretes *synovial fluid*.

Bursae are hollow sacs lined with synovium and contain a small amount of synovial fluid.

SYNOVIAL FLUID:

The surfaces of articular cartilage are separated by a space filled with synovial fluid, a viscous liquid that lubricates the joint. Synovial fluid is an ultra-filtrate of plasma into which synovial cells secrete hyaluronan and proteoglycans.

OSTEO-ARTHRITIS OF KNEE JOINT

Synonyms:

Osteoarthrosis, Degenerative joint disease, Hypertrophic arthritis.

Definition:

It is defined as a chronic, degenerative, non-inflammatory joint disease characterized by destruction of articular cartilage and formation of new bone at the joint surfaces and margins.

PRIMARY OSTEOARTHRITIS OF KNEE JOINT

In this, no obvious predisposing cause is evident.

The process begins by the end of 4th decade and then progressively and steadily increases producing clinical symptoms.

Though exact cause is not known, the following factors are suspected to play an important role in the causation of primary osteoarthritis;

Obesity

Aging, genetics and Heredity

Wear and tear with repeated minor trauma

Occupation involving prolonged standing, sports

SECONDARY OSTEOARTHRITIS OF KNEE JOINT:

There is a clear association with some predisposing conditions.

Major causes for secondary osteoarthritis of knee joint are as follows;

Obesity, valgus and varus deformities of knee

Intra articular fractures of the knee

Rheumatoid arthritis, infection, trauma, T.B, etc

Hyperparathyroidism

Haemophilia

Syringomyelia

Metabolic diseases

Neurological diseases like diabetes

Overuse of intra-articular steroid therapy

Generally, secondary osteoarthritis occurs in the younger age groups and is more severe than the primary. Apart from all features of osteoarthritis, secondary osteoarthritis has the features of the corresponding aetiological condition.

PATHOGENESIS:

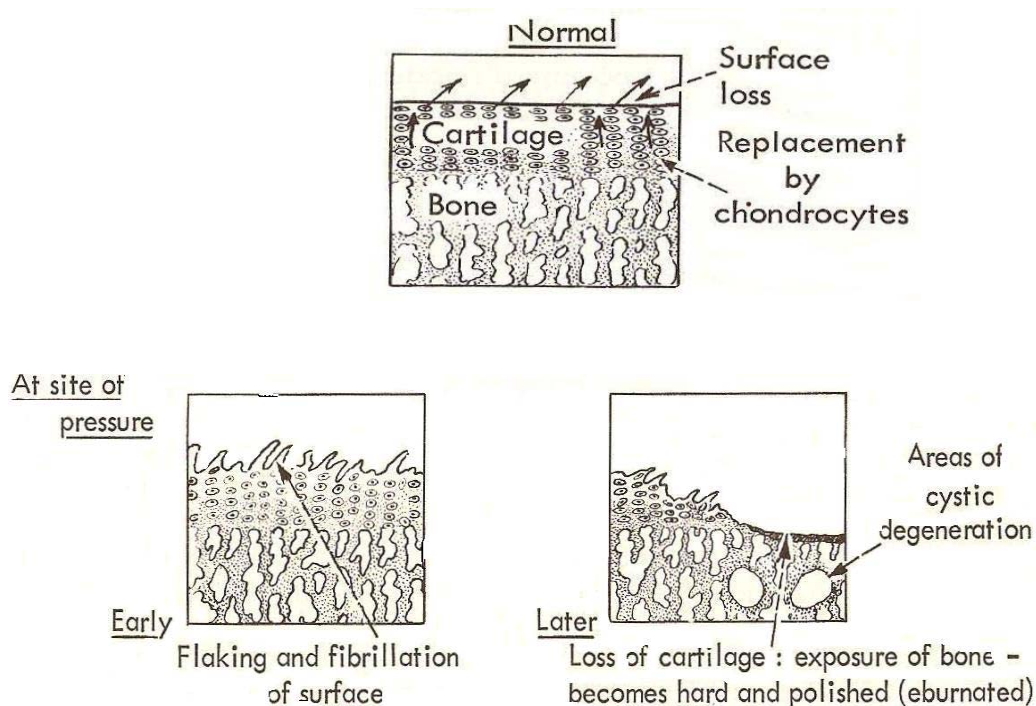
In both types of osteoarthritis, the basic pathological processes are the same.

The primary lesion consists of degeneration of the articular cartilage until the bone matrix is exposed. OA principally targets the patello-femoral and medial tibio-femoral compartments of knee joint.

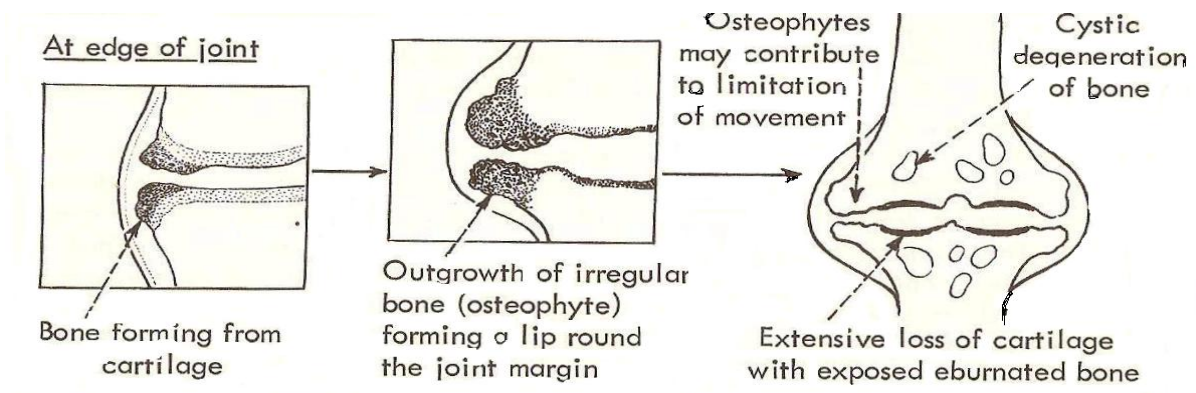
- **Articular cartilage:**

The mechanism of damage to cartilage in OA appears to be the breakdown of cartilage type II, probably by *IL-1*, *TNF* and *nitric oxide*. These pro-inflammatory cytokines stimulate production of the degenerative enzymes and promote cartilage degradation.

Cartilage degradation is mediated by enzymes such as *matrix metalloproteinases* and *glycosidases*.



The earliest change in OA is in the chemical composition of the matrix which becomes softer. Although the turnover of aggrecan component is increased, the concentration of aggrecan eventually falls. The decrease in size of the hydrophilic aggrecan molecules increases the water concentration and swelling pressure in cartilage, further disrupting the retaining scaffolding of type II collagen and making the cartilage surface (fibrillation), development of **deep vertical clefts**, localized chondrocytes death and decrease in cartilage thickness. Cartilage loss is focal rather than widespread and usually restricted to maximum load-bearing part of the joint. This results in breaking off of pieces of cartilage exposing subchondral bone. Radiologically, this progressive loss of cartilage is apparent as **narrowed joint space**.



The erosion of cartilage is not uniform, so relatively at first, the areas of bone are exposed in a patchy fashion and there are intervening islands of relatively normal cartilage.

The OA changes in cartilage encourage the deposition of calcium pyrophosphate dehydrate (CPPD) and apatite crystals. This may results in more overt inflammatory component (stiffness, effusion) and superadded acute attacks of synovitis, which predicts more rapid radiographic and clinical progression.

- **Bone:**

As a result of cartilage degeneration, the non-articular areas of the bones are elevated above the remainder of the surface and project circumferentially to give the appearance known as *lipping*. At the margins of the joint there is production of new fibrocartilage which then undergoes endochondral ossification to form osteophyte. These are cartilaginous outgrowths at the joint margins which later get ossified. Osteophytes give the appearance of lipping of the affected joint Irregular outgrowths appear in this area at first, cartilaginous but eventually becoming ossified to form *osteophytes*.

The denuded subchondral bone appears like polished ivory. There may be erosion of two unprotected bone ends wear on each other. This may ablate the trabaculae and lead to a smooth shiny surface called *eburnation*, often with deep linear grooves. There is proliferation of blood vessels and probably an increase in blood supply to the subchondral bone with thinning of cartilage over the pressure areas, but proliferation of cartilage where there is no pressure. The new bone proliferation is particularly around the capsular attachment. These changes result in remodeling of bone and changes in the shape of joint surface

leading to flattening and mushroom-like appearance of the articular end of the bone. The proliferated cartilage is now invaded by larger blood vessels and finally replaced by bone (osteophytes).

In formation of ***subchondral cysts*** in OA, there is initially an oedema in the subchondral marrow, which is followed by the formation mucinous fatty marrow and dilatation of surrounding sinusoids. There is mucoid secretion within the center of this area and expansion of the cyst cavity by osteoclastic resorption of bony trabeculae. Surrounding this, there is some osteoblastic response and a sclerotic wall is formed. Other theory for the cyst is that the cysts arise from herniation of synovial fluid through cracks within the denuded subchondral bone plate. ***Cysts or holes*** often develop, possibly the result of small areas of osteonecrosis caused by the increased pressure in bone as the cartilage fails in its load transmitting function.

Loosened and fragmented osteophytes may form free '***joint mouse***'
or 'loose bodies'

- **Synovium :**

Initially, there are no pathologic changes in the synovium and capsule.

Calcium pyrophosphate dehydrates (CPPD) crystal deposition in association with OA is common in knee joint, may results in obvious inflammatory component (stiffness, effusion) and superadded acute attacks of synovitis.

In advanced cases there is low-grade *chronic synovitis* and *villous hypertrophy*. There may be some amount of synovial effusion associated with chronic synovitis. These changes are secondary.

Osteochondral bodies commonly occur within the synovium, reflecting chondroid metaplasia or secondary uptake and growth of damaged cartilage fragments.

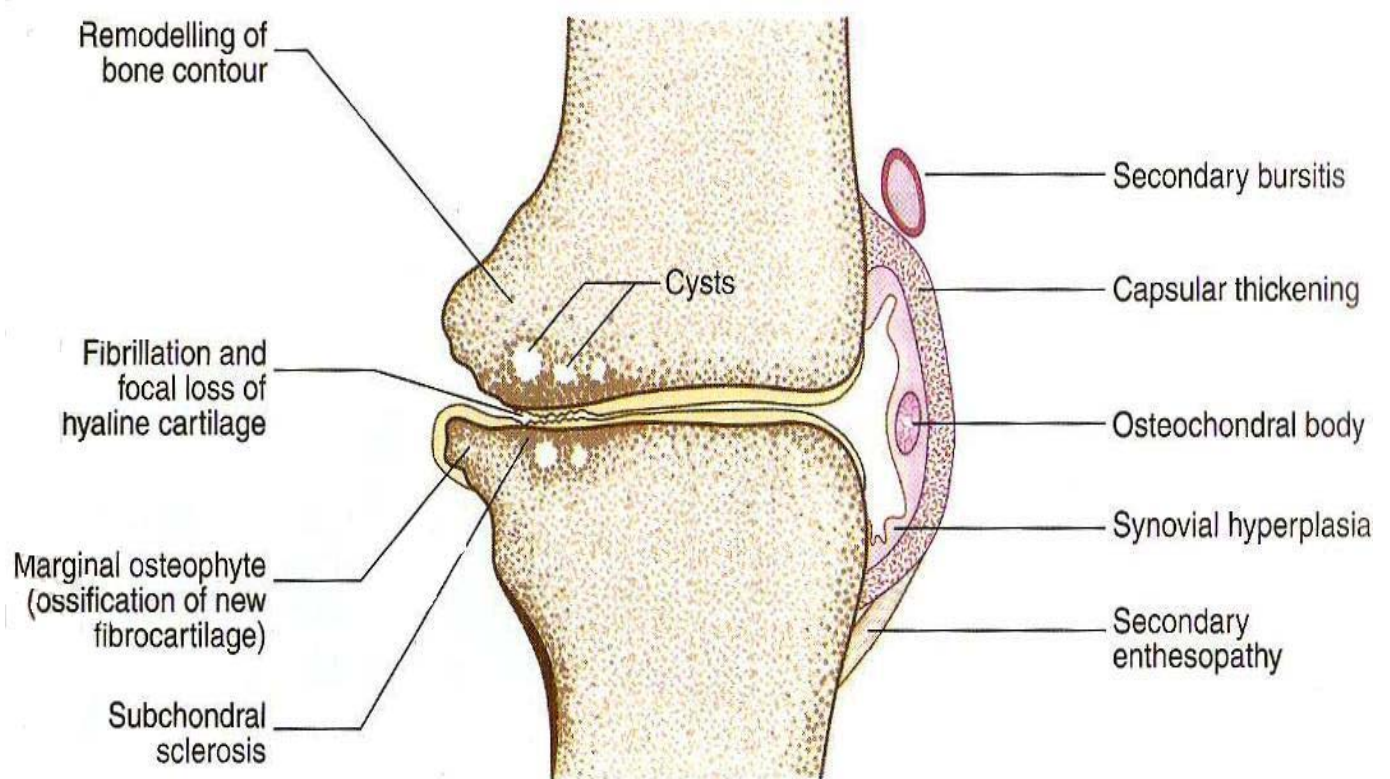
The synovial tags or polyps are insinuated into the joint, and where very exuberant the process is referred to as *lipoma arborescens*. Cartilage formation occurs in these tags and they are then liable to be broken off into the joint, when they form *loose bodies*.

- **Capsule & muscles :**

Outer capsule also thickens and contracts, usually retaining the stability of the remodeling joint. The muscles that act over the joint commonly show non-specific *type II fiber atrophy*.

SEQUENCE OF PATHOLOGICAL EVENTS:

- Fibrillation due to loss of water in articular cartilage
- Complete loss of articular cartilage causes pressure on underlying bone
- Sclerosis of bone and later eburnation
- Subchondral cyst due to degenerated microfractures
- New bone formation results in osteophyte formation.



Pathological changes in osteoarthritis.

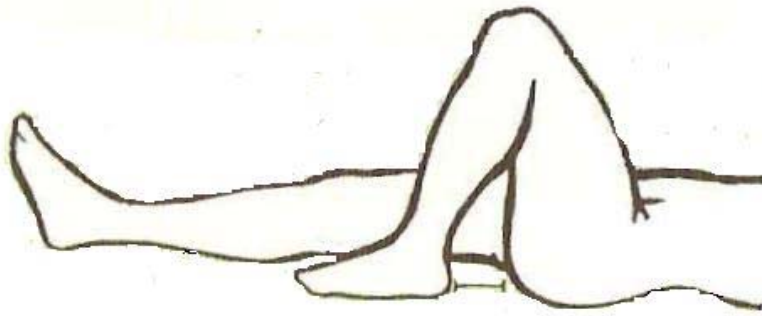
CLINICAL FEATURES & LOCAL EXAMINATION:

☹ PAIN

- Pain is localized to anterior or medial of knee and upper tibia
- Patello-femoral pain is worse going-up and down or inclines
- Morning stiffness, which subsides over the day after some activity
- Joint soreness after periods of overuse or inactivity
- Pain is less in the morning and worse in the evening after a day's activity

☹ OTHER FEATURES:

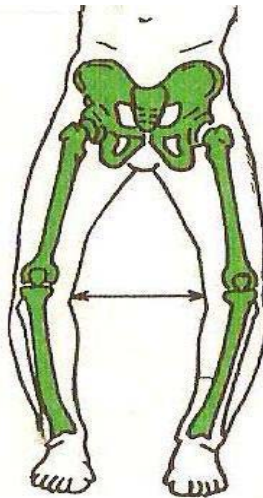
- Joint-line or peri-articular tenderness
- Medial ligament enthesopathy, giving tenderness of the upper medial tibia
- Coarse crepitus
- Bony swelling around the knee joint line
- No detectable warmth of the joint to the touch
- weakness and wasting of quadriceps muscle
- History of locking due to loose bodies within the knee joint
- Terminal movements (flexion / extension) are restricted.



Loss of terminal flexion in osteoarthritis knee

- Genu varum deformity may be seen in very advanced cases

Less commonly valgus or flexed flexion deformity seen



Showing genu varum with increased distance. Genu varum is said to exist if there is appropriate gap between the medial femoral condyles when the legs are together

INVESTIGATIONS:

Laboratory investigations are usually within normal limits.

Radiological examination of the knee joint is the most important diagnostic tool.

The following are the radiological features seen in osteoarthritis;

- ***Loss of joint space*** – due to destruction of articular cartilage
- ***Sclerosis*** – due to increased cellularity and bone deposition
- ***Subchondral cysts*** – due to synovial fluid intrusion into the bone
- ***Osteophytes*** – due to revascularization of remaining cartilage
- ***Bony collapse*** – due to compression of weakened bone
- ***Loose bodies*** – due to fragmentation of Osteochondral surface
- ***Deformity and mal-alignment*** – due to destruction of capsule and ligaments

OTHER INVESTIGATIONS:

- Synovial fluid analysis – shows non-inflammatory picture
- Bone scan – shows increased uptake of technetium-99m
- MRI and CT – helps to diagnose subchondral cysts and osteophytes etc...

DIFFERENTIAL DIAGNOSIS:

- Acute septic arthritis
- Chronic TB arthritis
- Charcot's joint
- Rheumatoid arthritis

DISCUSSION

According to **PARA RAASA SEKARAM**, the vaatha disease classification is particular about regional (local) pathology.

Among the three humors, vaatham is the initiator of all activities of body. The clinical study on all selected patients was done. Investigations were done by both Siddha and modern parameters. The discussion is based on the results observed on various headings.

INTERPRETATION OF OBSERVED CLINICAL PARAMETERS:

1. Age and sex reference:

The incidence of MUZHANKAAL VAATHAM occurs people above 40 and seems predominantly in females.

2. Socio-economic status:

The occurrence of disease is common in all groups of peoples.

3. Diet habits:

On observation, the disease developed predominantly in non-vegetarian habited peoples.

4. Seasonal changes (Paruva kaalam):

Though the symptoms developed in various seasons of the whole year, 80% of patients were reported during Munpani kaalam.

5. Thina:

Most of the patients were reported from Marutha nilam

6. Kaalam (Life span):

Out of 20 cases, 95% of cases were found to be within pitha kaalam i.e. between 33 – 66 years of age groups. In most of cases, the onset of the disease was during Pitha kaalam.

INTERPRETATION OF ENVAGAI THERVUGAL:

1. Naadi:

In the Naadi examination of the suspected patients, the observed Naadi was Pitha vaatham and Vaatha pitham.

2. Sparisam (by palpation):

By palpating the skin on overall body, no characteristic abnormal sense of heat was observed even in the affected joint.

3. Naa:

On examination, paleness was observed in 75% of cases.

4. Niram (skin complexion):

All patients were having mixed complexion i.e. kalappu Niram.

5. Moothiram:

- a) Manam (odor) – No abnormal smell was found
- b) Nurai – No abnormalities were found
- c) Niram (color) – Dark yellow color of urine was found in all cases
- d) Edai – No abnormal was found
- e) Engel – No deposition was found in all cases

6. neik-kuri (Urine-Oil diagnosis):

A drop of sesame-seed oil was dropped over the urine contained tray. After a few minutes, there was a gradual spreading of drop like ring (Aazhi).

7. Mukkuttra nilaigal:

- a) Vali – Out of 20 cases, Viyaanan and Samaanan were affected in all cases, while Abaanan was affected in 75% of the cases.
- b) Azhal – Ranjagam was affected in 75% of cases, whereas Saathagam was affected in almost all cases.
- c) Iyyam – Santhigam was found to be affected in all cases.

8. Udal Kattugal:

Saaram, Oon and Enbu were affected in all cases, whereas Senneer was affected in 75% of cases.

INTERPRETATION OF MODERN PARAMETERS:

Out of 20 cases, about 60% were found to be over weight
(BMI Range: 25.00 - 29.90)

Blood total count and differential count were normal in all cases. Hb may below normal level in 75% of cases.

In X-ray study, all cases were having narrowed joint space and osteophytes. In addition to the above findings, subchondral sclerosis, bony cysts and loose bodies were found in three cases.

CONCLUSION

The clinical study of **MUZHANKAAL VAATHAM** is mainly based on siddha diagnostic methods. At the same time, the author also has conducted modern investigations relevant to MUZHANKAAL VAATHAM. It reveals that, all the MUZHANKAAL VAATHAM patients have findings of Osteoarthritis of knee joint.

MUZHANKAAL VAATHAM is a degenerative disease commonly occurs in Pitha and kaba kaalam of one's life cycle. This is also stressed in modern science.

The bio-chemical derangement of muco-polysaccharides of cartilage is the main and foremost pathology in MUZHANKAAL VAATHAM.

Cartilage fibrillation, cartilage degeneration, eburnation of bones, osteophyte formation, narrowing of joint space, subchondral sclerosis, bony cysts, loose body formation, these are the basic pathological changes in MUZHANKAAL VAATHAM.

Crepitaion, pain & tenderness over medial tibial condyl, swelling, varus deformity are the clinical diagnostics.

Clinical diagnosis, Nei-kuri (ring like appearance), X-ray are playing a great role in the diagnostic purpose of MUZHANKAAL VAATHAM.

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POST GRADUATE RESEARCH CENTRE
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PALAYAMKOTTAI, THIRUNELVELI – 627 002**

CASE SHEET PROFORMA FOR “MUZHANKAAL VAATHAM”

I.P.No	:	Occupation	:
Bed no	:	Income	:
Ward no	:	Nationality	:
Name	:	Religion	:
Age	:	Date of admission:	
Sex	:	Date of discharge	:
Permanent address:		Diagnosis	:
		Medical officer	:

Complaints and duration :

History of present illness:

History of previous illness:

Personal history including habits:

Family history:

GENERAL CONDITIONS ON EXAMINATION:

1. Consciousness
2. General appearance
3. Stature
4. Nourishment
5. Skin changes
6. Pallor
7. Jaundice
8. Cyanosis
9. Clubbing
10. Lymphadenopathy
11. Abdominal distension
12. Jugular venous pulsation
13. Engorged veins
14. Koilonychia
15. Pedal oedema
16. Generalized oedema
17. Temperature
18. Pulse : rate
 - Rhythm
 - Volume
 - Character
 - Peripheral pulses
 - Pulses paradoxes
19. Respiration:
 - Rate
 - Rhythm
 - Character
20. Heart rate
21. Blood pressure: Upper limb (RT):
 - Upper limb (Lt):
 - Lower limb (RT):
 - Lower limb (Lt):
22. Body weight:
23. Miscellaneous:

SIDDHA ASPECT:

- I. Nilam:
 - a. Kurinchi
 - b. Mullai
 - c. Marudham
 - d. Neidhal
 - e. Paalai
- II. Pauvakaalam
 - a. Kaar kaalam (Aavani - Purattaasi)
 - b. Koodhir kaalam (Aippasi - Kaarthigai)
 - c. Munpani kaalam (Maargazhi - Thai)
 - d. Pinpani kaalam (Maasi - Panguni)
 - e. Ilavaenil kaalam (Chitthirai - Vaihaasi)
 - f. Mudhuvenil kaalam(Aani - Aadi)
- III. Yaakai (Udal)
 - a. Vazhi udal
 - b. Azhal udal
 - c. Iyya udal
 - d. Thontha udal
- IV. Gunam
 - a. Satva gunam
 - b. Rajo gunam
 - c. Thamo gunam
- V. Pori Pulangal
 - a. Mei – Sensation
 - b. Vaai – Taste
 - c. Kann – Vision
 - d. Mookku – Smell
 - e. Sevi – Hearing
- VI. Kanmaenthiriyam / Kanma vidayam
 - a. Kai -- Dhaanam
 - b. Kaal -- Kamanam
 - c. Vaai -- Vasanam
 - d. Eru vaai -- Visarkam
 - e. Karu vaai—Aanantham

VII. Udkaayam

Thol porutthu
Puyam
Muzhankai porutthu
Sayam
Kai-kulasu
Karabam
Anguli

Athakaayam

Iduppu porutthu
Thodai
Muzhankaal porutthu
Munkaal
Kudhi kaal
karabam
Anguli
Vamsi

VIII. Mummalam

- a. Malam
- b. Mootthiram
- c. Viyarvai

IX. Pira Uruppugalin nilai

- a. Irudhayam
- b. Puppusam
- c. Eraippai
- d. Manneeral
- e. Siru-kudal
- f. Perun-kudal
- g. Siruneeragam
- h. Siruneer-pai
- i. Moolai
- j. Karuppai

X. Uyir thaathukkal

(1) VATHAM:

- a. Piraanan
- b. Abanan
- c. Viyaanan
- d. Udhaanan
- e. Samaanan
- f. Naagan
- g. Koorman
- h. Kirukaran
- i. Deva dhathan
- j. Dhananjeyan

(2) PITTHAM:

- a. Anarpittham
- b. Ranjaga pittham
- c. Saadhaga pittham
- d. Aaloasaga pittham
- e. Piraasaga pittham

(3) KABAM:

- a. Avalanbagam
- b. Kiledhagam
- c. Poadhagam
- d. Tharbagam
- e. Santhigam

XI. Udal thaathukkal

- a. Saaram
- b. Senneer
- c. Oon
- d. Kozhuppu
- e. Enbu
- f. Moolai
- g. Sukkilam/Suronidham

XII. Envagai thaervugal

- a. Naa
- b. Niram
- c. Mozhi
- d. Vizhi
- e. Sparisam
- f. Malam
 - Niram
 - Eadai
 - Irugal
 - Ilagal

- g. Mootthiram
 - ❖ Neerkuri
 - Niram
 - Manam
 - Eadai
 - Nurai
 - Enjal
 - ❖ Neikkuri
- h. Naadi

LABARATORY INVESTIGATIONS:

1. BLOOD:

TC : cells/cu.mm
 DC : p %, L %, E %, M %
 ESR: 1/2hour :
 1hour:
 Hb%:
 Blood sugar: fasting :
 Postprandial:
 Serum cholesterol:
 Uric acid:
 Urea:
 VDRL:

2. URINE:

Albumin:
 Sugar :
 Deposits:

3. MOTION:

Ova:
 Cyst:

4. IMMUNOLOGICAL:

R.A.facor:

5. Radiographic Evaluation:

6. Serological Test For Syphilis:

7. Synovial Fluid Analysis:

8. Arthrography:

LOCOMOTOR SYSTEM:

INSPECTION:

- Overlying skin: Color
 - Scars and Ulcers
 - Peri articular swelling
- Bones: Deformity
 - Unusual posture
 - Muscle changes
 - Symmetrical distribution
 - Joint movement
 - Gait

PALPATION:

- Skin temperature
- Soft tissues
- Bony enlargement
- Crepitus
- Subcutaneous nodules
- Rheumatoid vasculitic lesion
- Lymphadenopathy
- Pitting oedema

RANGE OF MOVEMENT:

EXAMINATION OF INDIVIDUAL JOINTS: (RT & LT)

- Cervical spine
- Thoracic spine
- Lumbar spine
- Sacro-iliac joint
- Shoulder joint
- Elbow joint
- Wrist joint
- Interphalangeal joints
- Hip joint
- Knee joint
- Metatarso phalangeal joints

INDEX OF OSTEOARTHRITIS: (WOMAC)

CLINICAL PARAMETERS	RESPONSE				
	none(0)	slight(1)	moderate(2)	severe(3)	extreme(4)
PAIN:					
1.walking					
2.stair climbing					
3.nocturnal					
4.rest					
5.weight bearing					
STIFFNESS:					
1.morning stiffness					
2.stiffness occurring later in the day					
PHYSICAL FUNCTION					
1.descending stairs					
2.ascending stairs					
3.rising from sitting					
4.standing					
5.bending to floor					
6.walking on flat					
7.getting in or out of car					
8.going shopping					
9.putting on socks					
10.rising from bed					
11.taking off socks					
12.lying in bed					
13.getting in/out of bath					
14.siting on chair					
15.getting on or off toilet					
16.heavy domestic duties					
17.light domestic duties					
Total					

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16. Laboratory Investigations

S.No	OP/IP No	Blood Investigation										Urine Analysis		
		TC Cells / Cumm	DC %			ESR mm hrs		Hb%	Random	Urea mgs%	Cholestrol mgs%	Alb	Sug	Dep
			P	L	E	1/2	1							
1	OP.74162	9,200	52	44	4	5	10	80	74	-	-	Nil	Nil	NAD
2	OP. 76358	9,800	70	26	4	5	11	71	110	-	-	Nil	Nil	NAD
3	OP. 75847	9,200	55	42	3	25	52	71	100	-	-	Nil	Nil	Few epi-cells
4	OP. 1403	9,800	60	36	4	5	10	80	96	-	-	Nil	Nil	NAD
5	IP. 2885	9,000	62	34	4	10	22	80	100	-	-	Nil	Nil	NAD
6	IP. 93	9,800	70	28	2	5	10	80	80	-	-	Nil	Nil	NAD
7	IP. 96	9,600	68	27	5	5	11	72	92	-	-	Nil	Nil	NAD
8	IP. 104	9,500	56	40	4	22	45	70	90	29	164	Nil	Nil	NAD
9	IP. 76	9,600	68	27	5	30	62	78	80	17	158	Nil	Nil	NAD
10	IP. 2867	9,800	76	20	4	25	55	70	87	37	159	Nil	Nil	NAD
11	IP. 2944	9,600	52	44	4	5	11	66	77	30	150	Nil	Nil	NAD
12	IP.31	9,000	66	30	4	20	30	70	90	-	-	Nil	Nil	NAD
13	IP. 101	9,200	60	36	4	40	76	80	96	49	-	+	Nil	Amorp. Phos. crystals
14	IP. 46	9,200	62	30	8	20	45	70	89	21	158	Nil	Nil	Few Puscels
15	IP. 319	9,500	56	42	2	15	30	70	96	-	-	Nil	Nil	NAD
16	IP. 113	9,400	56	40	4	40	82	51	92	29	207	Nil	Nil	NAD
17	IP. 291	9,200	66	30	4	15	32	72	106	49	145	Nil	Nil	Few epi-cells
18	IP. 426	9,000	54	44	2	10	22	72	74	23	149	Nil	Nil	3-5 epi cells
19	IP. 564	9,200	60	36	4	40	65	71	80	-	-	Nil	Nil	NAD
20	IP. 162	9,000	62	34	4	30	62	74	96	33	163	Nil	Nil	NAD

EC - Epithelial Cells,